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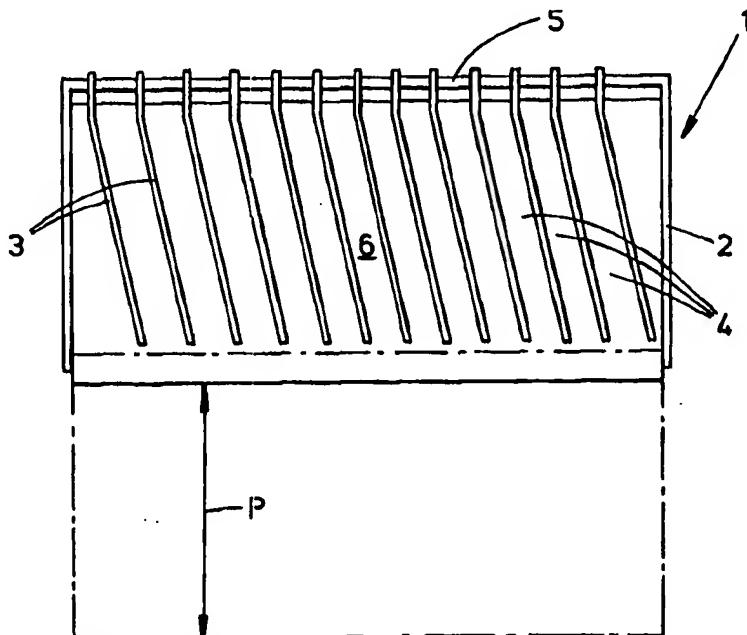
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(21) International Application Number: <b>PCT/SE97/01812</b> (22) International Filing Date: 29 October 1997 (29.10.97)  (30) Priority Data: 9603996-1 1 November 1996 (01.11.96) SE  (71)(72) Applicant and Inventor: SÖDERSTRÖM, Sven-Eric [SE/SE]; Älgvägen 16, S-199 71 Enköping (SE).  (74) Agents: MRAZEK, Werner et al.; Dr. Ludwig Brann Patentbyrå AB, Drottninggatan 7, P.O. Box 1344, S-751 43 Uppsala (SE).	(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  Published <i>With international search report. In English translation (filed in Swedish).</i>	

(54) Title: DEVICE FOR SORTING DOCUMENTS



(57) Abstract

A device (1) for sorting documents comprising a frame (2) in which are arranged a number of vertical and substantially parallel compartments (4) in which documents are placed standing up. Said compartments (4) are delimited by means of partitions (3) which at their inner vertical sides and/or at an inner portion of their upper sides are fixedly or removably connected to elements (5) forming part of the frame (2) or arranged therein. The sorting device is characterised in that the compartments (4) have a bottom (6) in which the sorted documents rest, said bottom (6) and partitions being displaceable in relation to one another in a direction which, when seen in a horizontal plane, at least in the final stage of the movement, deviates from the general direction in which the partitions (3) extend.

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**DEVICE FOR SORTING DOCUMENTS**

The present invention relates to a device for sorting documents, mail and the like, which device is designed for arranging the documents in a bundle with a desired order between the documents, and to accomplish this in a labour-saving way.

In post offices, in mail departments of companies, institutions, government agencies and the like, there is a need for a rational way of handling large quantities of mail, so that the mail may be distributed to the addressee in a labour-saving way.

Conventional sorting cabinets for documents/mail comprise compartments for sorting the documents in a certain order of distribution, e.g. street address or room number. The documents are sorted into the compartments, and are then removed and gathered in bundles for distribution within, for example, a postal district.

The present invention aims at providing a sorting device which facilitates the bundling of the once sorted documents by comprising means for emptying the sorting compartments in such a way as to automatically bundle the documents in the sorting order.

This aim is reached by means of a device for sorting documents in accordance with the appended claims.

The invention will be more closely described in the following, with reference to the annexed drawings, in which

Figure 1 is a diagrammatical top view of a first embodiment of the sorting device,

Figure 2 is a diagrammatical top view of a second embodiment of the sorting device,

Figure 3 is a diagrammatical sectional view of the first embodiment in figure 1,

Figure 4 is a diagrammatical sectional view of a third embodiment of the sorting device,

Figure 5 is a view, partly broken away, of a detail of the invention,

Figure 6 is a diagrammatical top plan view of a fourth embodiment of the invention, and

Figure 7 is a diagrammatical side view of two interconnected sorting devices according to any of the disclosed embodiments of the invention.

Figure 1 shows, in a top plan view, a device for sorting documents 1 comprising a frame 2, in which partitions 3 are arranged in a spaced relationship, forming a number of compartments or sorting compartments 4. Said partitions 3 are fixedly or removably arranged on the rear section or rear element 5 connected to the frame 2, said partitions extending substantially parallel with respect to each other. In the first embodiment shown in figure 1, the partitions are bent so that, in a horizontal plane, they will extend in an oblique direction with respect to the frame, displaying right angles.

Extending below the partitions 3, spaced apart from their lower edges, is a horizontal plate member which forms the bottom 6 of the sorting compartments 4. Said bottom member 6 is withdrawable from the frame in the direction of arrow P, and displacable with respect to the partitions 3 in a direction P which deviates from the direction in which said partitions extend. The dot-dash line shows the bottom member in a withdrawn or displaced position. Slidable guide means, e.g. guide rails, not illustrated, are arranged in the frame to act as bearing means to allow for the displacement of the bottom member 6.

Figure 2 shows, in a view similar to that of figure 1, a device 10 for sorting documents in accordance with a second embodiment of the invention. Said device 10 has straight partitions 13 extending mainly at right angles in relation to the frame 12, and run parallel with respect to each other, thus forming a number of sorting compartments 14. The partitions 13 are arranged in the frame 12 by suitable means, e.g. as described above, the lower edges of said partitions extending to, although spaced from, a bottom member 16 of the sorting compartments, arranged below said partitions.

The bottom 16 of the sorting compartments is arranged on slidable guiding means (not shown) extending obliquely with respect to the frame 10, in order to, when withdrawn, be displaced in a direction P' which deviates from the general direction in which the partitions 13 extend. The dot-dash line indicates the bottom 16 withdrawn from the frame.

Figure 3 shows the first embodiment in a diagrammatical sectional view with one of the sides of the frame broken away in order to illustrate the displacable arrangement of the bottom member 6 on slidable guiding means 7, which guiding means are arranged at the lower edge of the side of the frame. In the figure is indicated also the way in which the partitions may be removably arranged in the frame by means of snap-lock means 8 cooperating with rods 9 or the like, which, in turn, are fixedly arranged in the frame 2. Reference numeral 3' indicates a bending line of the partition 3.

Figure 4 is a sectional view, generally corresponding to figure 3, differing in that the frame 22, in a third embodiment, has a fixedly arranged bottom member 26. The partition 23 extends, in an horizontal plane, obliquely with respect to the frame 22, said partition displaying, therefore, a bending line 23'. It is appreciated that the oblique orientation of the partition with respect to the frame could be provided for in other ways considered appropriate by the person

skilled in the art. The partitions 23 are fixedly or removably arranged, e.g. by means of snap-lock means 28, on rods 29, which, in turn, are directly or indirectly fixed to slidable guiding means 27 fixed to the side the frame. The assembly of partitions 23 is, thus, displacably arranged in the frame 22, for relative movement therewith, and relative the bottom member 26 in a direction which, in a horizontal view, deviates from the general direction in which the partitions extend.

Figure 5 shows, partly in side view, partly in plan top view, an embodiment of the snap-lock means 8, 28, fixed to the rear edge and the top edge of a partition 13 which is partly broken away. The drawing figure illustrates the way in which the snap-lock member may be used as a spacer for determining the width of the compartments 14. By means of the snapping function, a partition may easily be removed in order to, should the need arise, increase the width of a compartment associated with a certain addressee.

Figure 6 shows a fourth embodiment 30 of the invention, in which a sorting compartment bottom member 36 is slidably arranged on a carriage means 31, which in turn is slidably supported on guide means, e.g. guiding rails 37 in a frame 32. The frame has removably arranged partitions 33 for forming sorting compartments 34 which extend mainly parallel and at right angles with respect to the frame 32. A bracket 35, which is fixedly arranged in the frame 32, extends under the bottom member 36. Said bracket has a notch 38 which, at least in an outer portion extends in a direction which deviates from the general direction in which the partitions extend. The outer portion of the notch may be placed with an angle in relation to the frame/partitions, or, as shown in the drawings, have an arcuate form. The notch 38 receives a pin 39 extending from the bottom side of the bottom member, which is guided in said notch, when the carriage means 31 is withdrawn from the frame, in order to displace the bottom member 36 in a direction P" which, at least during the final phase of said withdrawal, deviates from the general direction in which the partitions extend.

During the displacing movement the bottom member 36 slides in guiding members 40 of the carriage means 31.

When documents, letters or the like are to be sorted, these are placed in the respective compartment, in accordance with the order in which they are to be distributed, in such a way that the lower edge of each document rest on the displacable bottom 6, 16, 26, 36 of the compartment. When all documents are sorted, they are to be arranged in bundles, in the same sorting order, then to be placed in a carriage, a post bag or similar for distribution to the addressees.

Due to the fact that the bottom of the sorting device is displacable in relation to the partitions, in a direction which deviates from the general direction in which said partitions extend, the documents will, during the displacing movement fall, in a controlled manner, in the same direction, after which they may be pushed together into bundles in correct order in an easy manner.

For the person skilled in the art it is, of course, an obvious constructive step, to interconnect a number of sorting devices, as shown in fig. 7, said sorting devices, then, including means (not shown) for interconnection side by side or on top of each other.

Several embodiments of the invention are disclosed, which all share the common feature of mutual displacability of the bottom and the partitions in a direction which deviates from the general direction in which the partitions extend, through which displacing movement is achieved the controlled felling of the sorted documents in a common direction.

Concerning details it should be mentioned that the sorting device may be designed as a cabinet or a frame construction, the partitions may be made from wood, metal or plastic plates or string elements, the device may be supported by a framework, rest on a shelf or on a table, on beams or rails, as deemed

necessary or desirable. Further, the sorting device preferably has a surface layer with a suitable friction coefficient in order to prevent the lower edges of the documents from sliding during the withdrawing movement, and may for example be coated with a layer of a cellular plastic material.

## CLAIMS

1. Device for sorting documents, comprising a number of compartments arranged substantially parallel and vertical in a frame in which compartments documents are placed standing up, said compartments being delimited by means of partitions which at their inner vertical sides and/or at an inner portion their upper sides are fixedly or removably connected to elements forming part of the frame, said compartments having a bottom on which the documents rest, said bottom being displacable in relation to the partitions, **characterised in that** said bottom and partitions are mutually displacable in a direction which in a horizontal plane deviates from the general direction in which said partitions extend, said displacement being accomplished by said bottom or said partitions being slidably arranged on guiding means which in turn are arranged, in the frame, in a direction which is oblique in relation to the direction in which the partitions extend.

2. The device of claim 1, **characterised in that** the bottom of the sorting compartments is arranged in the frame displacable in a direction which deviates from the general direction in which the partitions extend.

3. The device of claim 1, **characterised in that** the partitions are arranged in the frame displacable in a direction which deviates from the general direction in which the partitions extend.

4. The device of claim 1, **characterised in that** the partitions are arranged with an angle in relation to the frame, the bottom of the compartments being displacable in a rectilinear direction in relation to the frame, when seen in a horizontal plane.

5. The device of claim 1, **characterised in that** the partitions are arranged with right angles in relation to the frame, the bottom of the

compartments being displacable in an oblique direction, when seen in a horizontal plane.

6. The device of claim 1 and 5, **characterised in that** the bottom of the sorting compartments is displacably arranged on a carraige means, said carriage means being supported and guided for rectilinear movement in relation to the frame and has means for simultaneous displacement of the bottom in a direction which deviates from the general direction in which the partitions extend, when seen in a horisontal plane.

7. The device of any of the above claims, **characterised in that** the upper side of the bottom of the compartments has a layer of material with high friction, e.g. a surface of a cellular plastic material.

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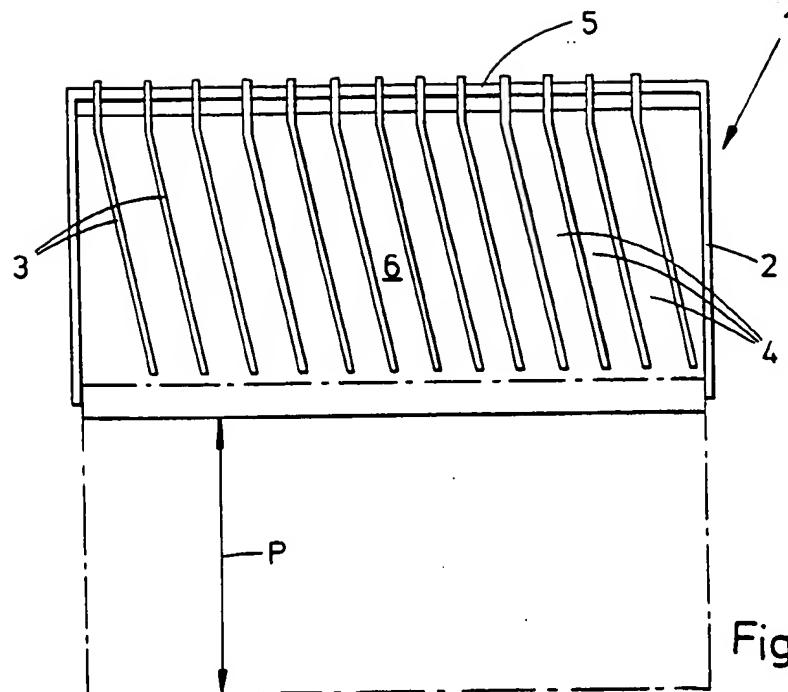


Fig.1

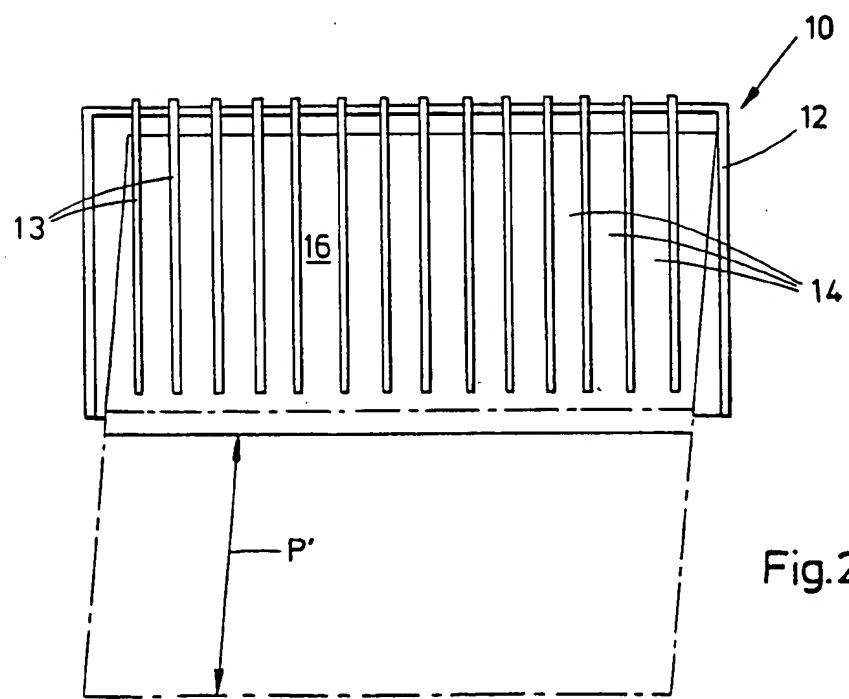


Fig.2

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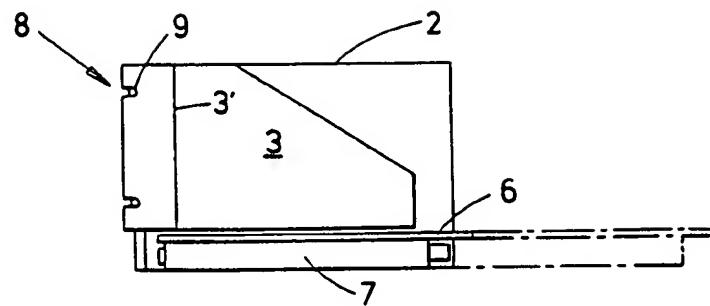


Fig.3

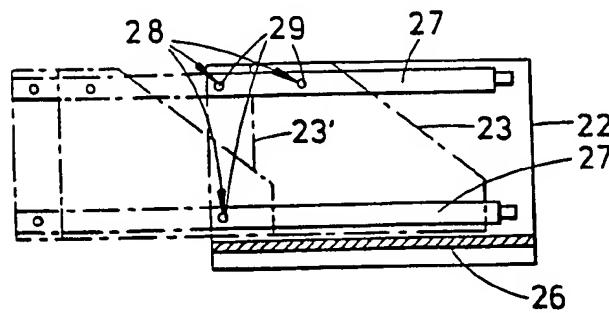


Fig.4

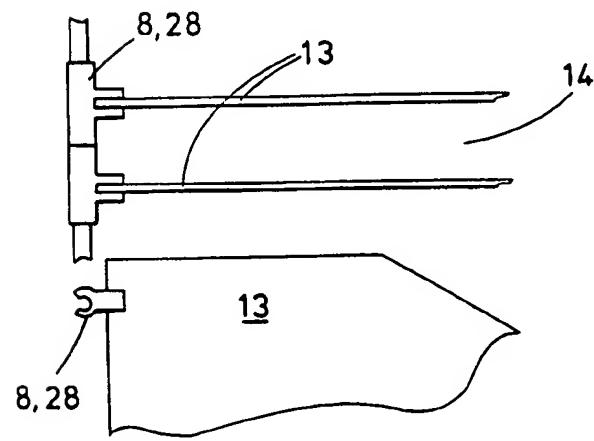


Fig.5

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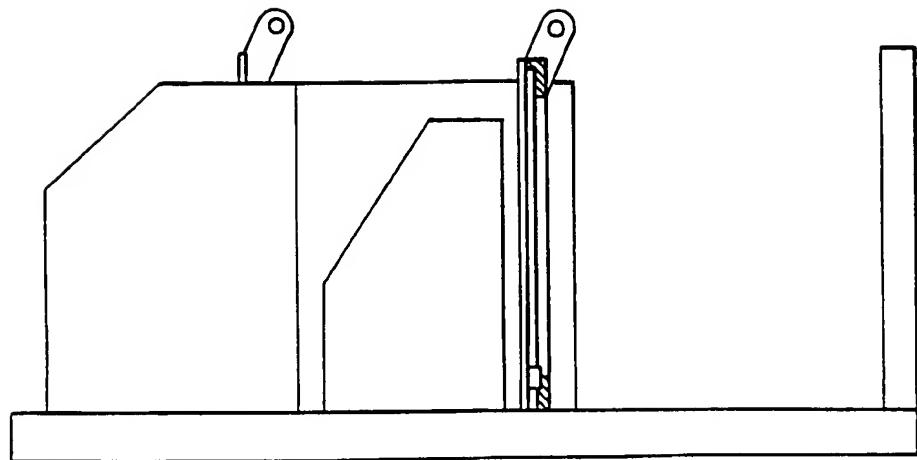


Fig.7

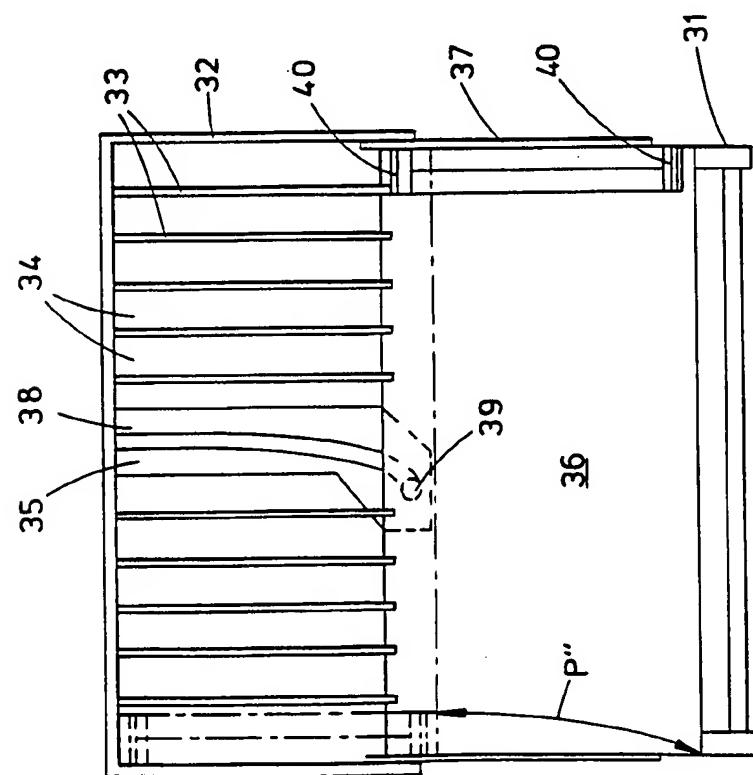


Fig.6

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SE 97/01812

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: G07C 7/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: G07C, B65H, A47B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 1030317 A (C.H. MIDDAUGH), 25 June 1912 (25.06.12) --	1-7
A	US 1217973 A (W. MANN), 6 March 1917 (06.03.17) --	1-7
A	US 1593326 A (R.T. BOURN), 20 July 1926 (20.07.26) --	1-7
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Further documents are listed in the continuation of Box C.

See patent family annex.

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**INTERNATIONAL SEARCH REPORT**  
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 1593326 A	20/07/26	NONE	
US 4484685 A	27/11/84	NONE	